

**ENVIRONMENTAL MANAGEMENT DEPARTMENT  
REVIEW COMMENT RESOLUTION**

Document No. and Title: Ecology Standard Operating Procedures, Draft Final, May 1991  
 Reviewer(s) Name(s): Colorado Department of Health

Comment No	Page No	Reviewer's Comments	Response
		<u>CDH Comments</u>	
		1. SOPs for toxicity testing with Cenodaphnia and fathead minnows need to be developed.	1. The laboratory used to complete aquatic toxicity tests will be required to meet all EPA guidelines and requirements, and provide EG&G with written SOPs. At this time a lab has not been selected. Once available, lab SOPs are then referenced in the General Radiochemistry and Routine Analytical Services Protocol (GRAASP).
		2. SOPs would be enhanced by the addition of lab procedures for sample processing and analyses.	2. Laboratories used to complete ecology work will be required to meet all applicable EPA guidelines and requirements, and provide EG&G with written SOPs. At this time labs have not been finalized. Lab SOPs are then referenced in the GRAASP.

Personnel contacted: \_\_\_\_\_

ADMIN RECORD

Date

11/11/91

A-SW-000132

REVIEWED FOR CLASSIFICATION/UCM

By: [Signature] / [Signature] / [Signature]

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		3. SOP 5.1 should be expanded to include endpoints and indices sought.	3. Endpoints and indices desired are specified in the project Field Sampling Plan (FSP). Collection methods usually are not different even if the samples may be collected for a different reason. Where a collection method or preservation technique varied according to the purpose of the sample these were segregated in the SOPs. Modifications or new requirements a will be covered in SOP Addenda.
		4. The first reference listed in SOP 5.1 needs to call out the more recent 1989 version, 17th edition.	4. The proper reference was updated.
		5. In Section 6.1 of SOP 5.1 the first and third paragraphs should be combined for clarity.	5. Paragraph one is an introduction whereas, paragraph three goes into more detail on physiological parameters specifically. Minor revisions to sentence structure in the draft have clarified this.
		6. The measurement of nutrients in the water should be included.	6. A full suite of water nutrient measurements will be collected seasonally at each surface water site identified for biological sampling. EE Work Plans schedule these activities. Only parameters to be measured in-situ are listed in SOP 5.1. Procedures for measurement of water nutrient parameters will be covered in a unique SOP associated with the Surface Water sampling SOP.

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		7. The sentence in SOP 5.1 that states "stream flow velocities will be matched within 100% of the study site current" needs to be made clearer.	7. The statement "stream flow velocities should be matched within 100% of the study site current" was rewritten for clarity. 100% was changed to +/- 50%.
		8. SOP 5.1 lists handling requirements for specific analyses for periphyton. The list should include taxonomic composition, community structure, and standing crop. Also, chlorophyll-a samples should consider use of ethanol as the preservative.	8. These endpoints will be listed with the appropriate handling requirements. For Chlorophyll-a, 90% aqueous acetone with 10% (v/v) MgCO <sub>3</sub> was selected because the lab doing the analysis requested it.
		9. How will Total Irradiance be measured?	9. Total Irradiance has been dropped from the in-situ parameters. The SOP has been changed to read turbidity will be measured using the Hach DREL/4 method.
		10. Total phosphorous should also be measured in the field.	10. Total phosphorous and other nutrients will be measured as stated in comment 6.
		11. In order to fill out form 5.0A the field personnel must have knowledge of identifying stream habitats. It can not be assumed that personnel will be trained on the SOP before conducting the field work.	11. Personnel are explicitly required to be trained and have the necessary knowledge to implement the SOPs. Training and education with experience are stated requirements.
		12. Procedures for laboratory processing of macroinvertebrates needs to be included.	12. Processing of macroinvertebrates beyond sample collection, preservation, and handling will be contained in a laboratory SOP and referenced in the GRAASP. Thios will be completed after Laboratories for macroinvertebrate tissue analysis have been finalized.

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		13. In collecting macroinvertebrates it needs to be clarified if they will be collected based on field identification or lab identification.	13. The text was clarified to indicate that samples will be collected for subsequent taxonomic identification in the lab.
		14. The first and sixth referenced documents listed in SOP 5.2 should be reconsidered.	14. The reference to the American Public Health Association Standard methods for the examination of wastewater was not omitted because it was used in development of this SOP. Reference to Merritt, 1984 was moved to the Bibliography list.
		15. Add Rapid Bioassessment Protocols for use in Streams and Rivers, Benthic Macroinvertebrates and Fish, U. S. EPA, EPA/444/4-89-001, May 1989, and Methods for Evaluating Stream, Riparian, and Biotic Conditions, U. S. Forest Service, Platts, et. al., 1983. to the references of SOP 5.2.	15. The references were added to SOP 5.2
		16. Add use of a kick-net to SOP 5.2.	16. A Kick-net of approximately 120cm x 80cm, and No. 30 mesh was added as an option in SOP 5.2. This size is specified in EPA guidance for collecting the significant sized populations applicable to an environmental evaluation of macroinvertebrate diversity and richness data.
		17. Explain how formalin will be disposed of at the laboratory. Ethanol would be a safer alternative.	17. Ethanol has been added to the SOPs for use as a perservative. EG&G does not dictate how a lab should dispose of formalin preserving a sample, this is their responsibility.

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		18. How was April-May and September-October selected for sampling benthic macroinvertebrates?	18. The SOP 5.2 has been changed to state sampling of benthic macroinvertebrates will be done between April and October in order to correspond with the seasonal presence of specific species of interest. As originally stated the time frame was unnecessarily restrictive.
		19. The use of 80% solution of ethanol will work equally as well as 10% formalin and will pose less of a hazard and disposal problem.	19. 70% ethanol was added as an option for preserving macroinvertebrates. The preservative used will depend on laboratory requirements. The lab doing taxonomic identification has been selected and has requested ethanol. Therefore, ethanol is being used.
		20. Explain whether the sediment sample will be taken before or after the biota samples. Also, explain how the exact spot for taking the sediment sample will be determined in relation to the biota samples.	20. SOP 5.2 has been expanded to discuss the relationship between biota samples and sediment samples.
		21. A kick-net or dip-net should be considered.	21. The use of a Kick-net has been added as an option in SOP 5.2. Limitations and applicable uses for a kick net are discussed in the SOP. When a kick net will be used will be specified in a project FSP if applicable.
		22. Preservation for tissue samples for SOP 5.2 should be discussed in section 6.4.	22. It is mentioned in the SOP that the tissue samples will be kept on Blue ice or Dry Ice for up to 4 hrs. and then frozen and maintained at -20 F.
		23. The title of the plankton SOP should state zooplankton and phytoplankton.	23. Plankton as a single term includes both zoo and phyto-plankton species. This is explained in the SOP introduction.

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		24. Laboratory procedures need to be specified in this SOP or in a separate SOP.	24. Laboratory Procedures will be written up by the labs as lab SOPs then referenced in the GRAASP and QAPjP. At this time laboratory procedures for biological samples are not finalized.
		25. Copepods need to be added to the plankton SOP.	25. Sampling of copepods is included in sampling for plankton as a general category. Phytoplankton, zooplankton (copepods and other organism types) will be sampled together and not separated. Discussion of this in section 2.0 was clarified.
		26. SOP 5.3 does not reference the most recent version of Merritt, 1978.	26. The more recent version, Merritt, 1984 have been referenced.
		27. Reference to the EPA Compendium of Superfund Field Operations needs to specify "Edition".	27. Edition was added.
		28. Lugols Solution is needed in the equipment list of SOP 5.3.	28. Lugols Solution was added as an option. When Lugol's is to be used is determined from a project FSP where analyses and tissues to be collected have been identified. Then the proper preservatives can be identified.
		29. Nutrient levels should be determined as part of the physiochemical properties of water in association with Plankton sampling.	29. Water nutrient levels will be measured at each surface water site selected for biological sampling seasonally. This is specified in the EE Work Plans. Only measurements to be done in-situ at the time of sampling are listed in the SOP.
		30. In sampling phytoplankton for chlorophyll-a a closing sampler should be used.	30. The use of closing samplers was added as an option.

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		31. Algal samples collected for chlorophyll-a should be filtered as soon as possible but this is not specified in SOP 5.3.	31. SOP 5.3 discusses methods of collecting algal samples in water. Filtration of the sample will occur at the lab. Lab methods are covered in the GRAASP. If a laboratory requires filtration in the field than an SOP Addenda will be prepared.
		32. Add sechi disc plate to the list of water quality parameters.	32. The Hach DREL/4 or equivalent FTU or NTU method was selected in order to provide a more quantitative measure of turbidity with more reproducible results
		33. SOP 5.4 for Fishes should mention the State Permitting requirements for collecting fish.	33. A discussion of permitting requirements was added.
		34. SOP 5.4 could reference the following: Colorado's Little Fish, A guide to the Minnows and Other Lesser Known Fishes in the State of Colorado, John Woodling, Colo. Div. of Wildlife, 1985; and EPA-503 / 8-89-002.	34. These references were added to the bibliography list.
		35. Backpack shockers will be more effective in small shallow streams. How will deeper ponds be sampled?	35. Backpack shockers have been added. Careful use of Gill nets is stated for collection from deeper ponds.
		36. Handling of fish needs to be clarified and expanded. SOP 5.4 needs to specify how fish will be killed.	36. Killing of fish by suffocation is specified. The fish sample handling section was revised to be more detailed.
		37. Is form 5.4A to be filled out for each fish or each site?	37. All field forms have been revised. Tracking information will be completed for each fish taken for sample analysis, while site description forms will be done once for each site.
		38. If fish age is to be recorded on Form 5.0A how will fish age be determined in the field?	38. Fish age will not be measured in the field. Scales will be collected and rings (for age determination) will be counted in the lab. Data then will be recorded in the database. Field forms were changed and age was removed.

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